

Claim 15 has been amended to recite a corresponding method step. Basis for the claim amendments is found at steps S1 and S3 of Figure 6.

As previously described, the invention is directed to an operating information control system of a construction machine provided with a wireless radio having a limited range (e.g., low power wireless radio). In accordance with the invention, a receiving device provided external to the construction machine causes transmission of the operating information from the construction machine to the receiving device upon the determination that the construction machine is within a transmission permissible area related to the limited range of the wireless radio. That is, the transmission controller comprises means for transmitting the operating information to the receiving device through the wireless radio when it is determined that the construction machine is within a transmission permissible area related to the limited range of the wireless radio.

For example, referring to Figure 6 of the present application, before transmitting the operating information stored on the construction machine (steps S2-S3), it is first determined whether the construction machine has passed into a transmission permissible area which is within the limited range of the wireless radio, e.g., whether the construction machine passed through a gate of the base station (step S1). Thus, in this example the operating information can be read in advance of the actual return of the construction machine, but by using only a low power radio and without the need for a costly satellite or commercial network link.

Concerning the rejections of paragraphs 2 and 3, Imanishi et al discloses that an information management controller 1 on a construction machine sends stored data to a monitoring station 19, but there is no description about the manner in which the stored data is sent. Particularly, there is no description of a wireless radio having a limited range and a determination if the construction machine is within a transmission permissible area related to

that limited range. Yamamoto also lacks a description of determining whether a construction machine is within a transmission permissible region which is related to the limited range of the wireless radio.

In recognition of this, the Examiner has relied upon Kageyama to modify the primary references “by incorporating the features from the vehicle interference prevention of Kageyama because such modification would provide a more efficient system to manage and monitor the vehicles.” However, Kageyama could provide no teaching for modifying the primary references such that the operating information is transmitted to the receiving device through a wireless radio when it is determined that the construction machine is within a transmission permissible area related to the limited range of the wireless radio.

As the Examiner has recognized, Kageyama is concerned with a vehicle interference prevention device for possibly unmanned construction vehicles at a work site. According to this reference, long range communication devices which have sufficient range to permit communication amongst vehicles in a large work site have slow transmission speeds, whereas high transmission speed communication devices have too short a range (paragraphs 0023-0025). Therefore, Kageyama proposes a system for preventing interference between vehicles wherein each vehicle has both a long range UHF transmitter and a shorter range SS transmitter, each of which transmits a vehicle ID and current position (paragraph 0137). The UHF transmission permits coverage of the entire site, while the SS transmission has higher transfer rates (paragraph 0142). Based upon the information transferred, and the time point of the information transfer (paragraph 0140), a range of possible locations for other vehicles at any given time is estimated (paragraph 0173).

Thus, the teaching of Kageyama is to transmit via both long range and short range communication means and to use the shorter range, higher transfer rate, communication

means where possible. However, there is no description in Kageyama of determining whether the construction machine are within a transmission permissible area related to the limited range of the short range SS transmission system. More specifically, there is no description that such a determination should be a basis for transmission. Instead, short and long range transmissions are conducted at certain time points, irrespective of a determination that the construction machine is within a transmission permissible area related to the range of the short range transmission system. The amended claims are therefore believed to define over any combination of Imanishi et al, Yamamoto et al and Kageyama.

Shubert et al is directed to an apparatus and method for wireless remote control of an output element coupled to a work vehicle while the operator is located outside the work vehicle's cab (column 2, lines 5-9). To this end, a fob 400 transmits a signal through the front window of the cab of a combine. Based upon the strength of the received signal, it may be determined whether the fob is located within a desirable proximity of the work vehicle. If so, the receiver is activated to respond to the control signals of the fob (column 12, lines 37-40). Shubert et al thus teaches controlling a work vehicle by transmitting information from a limited range wireless radio (fob) and activating the receiver only when it is determined that the work vehicle is within a transmission permissible range. However, the teaching in Sehubert et al is that construction information is transmitted *to the vehicle*, not the transmission of operating information from the vehicle to a receiving device external to the construction machine. Accordingly, the teaching which Shubert et al could provide for the modification of Imanishi et al or Yamamoto et al is to initiate the transmission of control information to a work machine based upon the determination of a permissible distance, not to transmit operating information *from the machine* to a receiving device based upon a

determination that a construction machine is within a transmission permissible area related to the limited range of the wireless radio.

Applicants further note that Shubert et al teaches activating the receiver in response to the determination that the fob is located within a desirable proximity to the work vehicle. Thus, regardless of the nature of the information being transmitted (control information to the work vehicle, versus the claimed feature of operating information from the work vehicle), the teaching of Shubert et al is for activation of the *receiver* in response to the determination. The claims, on the other hand, now recite that it is the transmission --not reception-- which is controlled by the determination that the construction machine is within a transmission permissible area. Again, Shubert et al could provide no teaching for this feature in combination with the primary references.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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Serial No: 09/961,112
Amendment Filed Herewith
7/9/03

IN THE CLAIMS

Please amend the claims as follows:

- 1. (Twice Amended) A system for controlling operating information of a construction machine comprising:
- operating information collection means at said construction machine for collecting operating information regarding operation of a construction machine;
- a first receiving device provided external to said construction machine;
- storage means at said construction machine for storing the operating information; and
- a transmission controller for transmitting the operating information read from the storage means to the first receiving device through a wireless radio having a limited range, wherein said first receiving device includes means for determining that the construction machine is within a transmission permissible area related to the limited range of the wireless radio,
- wherein said transmission controller comprises means for transmitting the operating information read from the storage means to the first receiving device through the wireless radio when said means for determining determines that the construction machine is within a transmission permissible area related to the limited range of the wireless radio.

9. (Twice Amended) A construction machine, comprising:

operating information collection means at said construction machine for collecting operating information regarding operation of a construction machine;
a first receiving device provided external to said construction machine;
storage means at said construction machine for storing the operating information; and
a transmission controller for transmitting the operating information read from the storage means to the first receiving device provided external to the construction machine through a wireless radio having a limited range, wherein said first receiving device includes means for determining that the construction machine is within a transmission permissible area related to the limited range of the wireless radio,

and wherein said transmission controller comprises means for transmitting the operating information read from the storage means to the first receiving device through the wireless radio when said means for determining determines that the construction machine is within a transmission permissible area related to the limited range of the wireless radio.

15. (Twice Amended) A method for reading operating information of a construction machine, comprising the steps of:

collecting and storing operating information at said construction machine regarding an operating state of a construction machine;

determining if the construction machine is within a transmission permissible area related to the limited range of a wireless radio having a limited range;

transmitting the stored operating information [to a] through the wireless radio [at said construction machine, said wireless radio] having a limited range when it is determined that the construction machine is within a transmission permissible area related to the limited range of the wireless radio; and

receiving the transmitted operating information by a receiving device external to said construction machine to thereby read said operating information from said construction machine[; and

determining if the construction machine is within a transmission permissible area related to the limited range of the wireless radio].